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UNITED STATES PATENT AND TRADEMARK OFFICE

Board of Patent Appeals and Interferences

Case Number: Redacted by Examiner Palabrica

For: METHOD TO CONTROL REACTIONS
INVOLVING ISOTOPIC FUEL
WITHIN A MATERIAL USING
ORTHOGONAL ELECTRIC-FIELDS

Serial no. 09/ 748,691

Filed: 12/26/2000

This is a division of Serial no. 07/ 760,970

Filed: 09/17/1991

Group Art Unit: 3641

Examiner: Palabrica, R.J.

August 26, 2011

Board of Patent Appeals and Interferences

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pro se APPELLANT'S REPLY BRIEF

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pro se APPELLANT'S REPLY BRIEF

1. This is the *pro se* Appellant's Reply Brief. It responds to the Examiners' Brief which is dated July 29, 2011 (cover as Exhibit "A", also called herein "Office's Brief").

2. The *pro se* Appellant thanks the Examiners (Dr. Palabrica now joined by Dr. Johannes Mondt) for finally sending *pro se* Appellant's Appeal Brief to the Board. The *pro se* Appellant notes that there have been three (3) Appeal Briefs demanded by the Examiner. These additional versions were unfairly demanded from the *pro se* Appellant. The Board is directed to Appellant's Notice to the Board, January 28, 2004 and Appellant's Notice to the Board, November 24, 2003. Copies are appended, and hopefully the Board will have the advantage of the final Appeal Brief, filed Jan. 28, 2004.

3. The *pro se* Appellant is disappointed that the Office's Brief again fails to correctly describe the invention or the record with accuracy.

4. The *pro se* Appellant is very disappointed that the Office's Brief again fails to address the Appellant's (then Applicant's) arguments, again misstating them.

5. The *pro se* Appellant is extremely disappointed that the Office's Brief has again failed to cite the Applicant's submitted Evidence, and has utterly failed to respond to them.

6. The *pro se* Appellant is astonished that the Office's Brief has unfairly added new material.

7. The *pro se* Applicant remains disappointed that the Examiner and Office have previously removed important submitted Evidence, that should have been before the Board. This was only revealed after the case left the Board of Patent Appeals; and that the Examiner Palabrica has attempted to obstruct justice by keeping the Appeal Briefs describing these actions from the Board.

8. In this Response, the *pro se* Appellant will address fully, and rebut with substantial Evidence, the faulty, fabricated, disingenuous" Arguments", including the new ones purported by the Examiner.

9. In the discussion below, reference is also made to previous relevant Declarations, letters and affidavits, copies of which are attached. These are relevant and important because they show that the Applicant was correct at the time of the above-entitled application and to operability and utility of the present invention.

10. In the discussion below, reference is made to several Declarations. They have probative value, are relevant to demonstrate the operability and utility of the above-entitled application and one of the fields in which it does operate.

11. In the Bass declaration, the Declarant is shown to be qualified as an expert with respect to the subject matter of the field in which the above-entitled invention does operate and the normal lawful mode in which the U.S. Patent Office should operate.

In the Chubb Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to electromagnetic energy and energy studies. Dr. Talbot Chubb (Ph.D., AB) served for 31 years at the Naval Research Laboratory.

In the Fox declaration and Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to the subject matter of that issue which has been brought up by the Office. Dr. Fox, PhD, MBA, is an engineer with experience in energy and other fields for more than thirty (30) years, and has published extensively in this scientific field.

In the Mallove declarations and Amicus Curiae Brief, the late Dr. Mallove was shown to be qualified as an expert with respect to the subject matter of the field in which the above-entitled invention does operate. Dr. Mallove (ScD Harvard, BS MIT) was a world-renowned author in this field and the former Senior Science Writer in the Press Office for the Massachusetts Institute of Technology (Cambridge, MA) at the MIT News Office during the DOE ERAB report in 1989 to which the Office wrongly refers, with a history of work at Hughes Research Laboratories, TASC (The Analytic Science Corporation), MIT Lincoln Laboratory, and the Voice of America [Washington, DC].

In the McKubre Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to metal-hydrogen systems, storage of hydrogen in metals, and the measurement of hydrogen loading. Dr. McKubre (Ph.D., Victoria University of Wellington, New Zealand; M.Sc.] has served at SRI International since 1979, most recently as its Director of the Energy Research Center, Pure and Applied Physical Sciences Division.

In the Rotegard Declaration and Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to the potential economics associated with the utility of the field in which the above-entitled invention does operate.

In the Storms Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to nuclear power production. Dr Storms, Ph.D. M.S., served for 34 years at the Los Alamos National Laboratory.

In the Straus Declaration, the Declarant is shown to be qualified as an expert with respect to the interactions of magnetic and electric fields, and electric charges and currents with materials. Mr. Straus [BSEE MIT, Registered Professional Engineer] is an internationally recognized expert in the area of electromagnetic compatibility.

In the Swartz Declaration, the Declarant is shown to be qualified as an expert with respect to electrical engineering, material science, electrophysics, electrochemistry, nuclear physics, surgery, medicine, and radiation oncology. Dr. Swartz (ScD, MSEE, EE, MIT; MD, Harvard) has worked at the Massachusetts Institute of Technology and Massachusetts General Hospital since late 1960's, including in the MIT Laboratory for Insulation Research.

In the Hagelstein Declaration, the Declarant is shown to be qualified as an expert with respect to electrical engineering, nuclear physics, quantum optics including work at the Massachusetts Institute of Technology.

In the Valone Declaration and Amicus Curiae Brief, the Declarant is shown to be qualified as an expert with respect to the subject matter of the field in which the above-entitled invention does operate and in the normal lawful mode in which the U.S. Patent Office should operate. Mr. Valone [M.A., P.E.] has years of experience at the U. S. Patent and Trademark Office in Art Unit 2858 (measuring, testing, instrumentation, and physics).

In the Verner declaration and in previous Declarations before this Group Art, the Declarant is, and has been shown, to be qualified as an expert in the issues and matters of which she reports.

12. These Declarations are relevant, important, and required because they show that the Applicant was correct at the time of the above-entitled application and the operability and utility of the present invention. They are also relevant, important, and required because they demonstrate cruel discrimination and systematic disingenuity by the US Patent Office against the Applicant -- and others in this field.

13. These Declarations are relevant, important, and required because many of these Declarations were previously withheld from the Board of Patent Appeals in and their sequestration (obstruction of justice and discrimination under color of law, for reasons unclear at the moment) only were revealed during discovery in the federal appellate court and SCOTUS, as will be discussed below.

14'. The Office's Brief disingenuously states:

"(2) Related Appeals and Interferences - The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

o In re Swartz No. 00-1108, 56 USPQ2d 1703 (decided November 2000) - Swartz patent application S/N 07/760,970.

o In re Swartz No. 00-1107, (decided November 2000) - Swartz patent application S/N 07/371,937.

o Appeal 2009-001853, decide November 2010 - Swartz patent application 10/646,143. "

The *pro se* Appellant is disappointed that the Office's Brief has again failed to accurately cite the other of Appellant's cases before the Board. The Examiners are misleading the Board of Patent Appeals despite knowledge of the other cases (confer Exhibit "B"). Appellant's other cases presently and previously before the Board directly affect and are directly affected by or have a bearing on the Board's decision in the pending appeal. They are not listed in the Examiner's Brief. The concept of loading of hydrogen in metals, in the heat generated, in the measurement of said loading, and in several of Appellant's inventions associated with that subject matter in the following.

Appeal No. 98-2593 regarding the specification and claims of application serial number 08-406,457

Appeal No. 97-3208 regarding the specification and claims of application serial number 07-339,976

Appeal No. 94-2921 regarding the specification and claims of application serial number 07-371,937

Appeal No. 94-2920 regarding the specification and claims of application serial number 07-760,970

Appeal No. 2009-1853 regarding the specification and claims of application serial number 10/646,143.

Appeal No. 03- number not known regarding the specification and claims of application serial number 09-748,695, Continuation of '970

The reason the Examiners are misleading the Board is likely that the Appeal Briefs have been withheld by the Examiner(s) who are exposed having also removed Evidence from those file folders in cases which were before the Board of Patent Appeals (*vide infra*).

ARGUMENTS REGARDING REJECTIONS

ARGUMENTS RE: 35 USC §112 first paragraph REJECTION

15. The Office states,

"Claims 1-5, 7, 9-15, 17, 19 and 20-24 are rejected under 35 U.S.C. 112, first paragraph' for the reasons given in ... section 6 above."

THE TRUTH - THE PURPORTED REASONS DO NOT RELATE TO THE PRESENT APPLICATION

The Examiner is entitled to his opinion but not to mischaracterizing the facts (confer Exhibit "G" and "H"). The Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection for any of several reasons. The Examiner's objection is flawed, not accurate, not relevant, and there are several problems with the Examiner's arguments (vide infra). In place of a cogent step-by-step substantive response, the Office handwaves to non-existent "reasons" and brazenly presents NEW arguments after FINAL, some of which are deeply flawed and simply wrong for several reasons involving accuracy, quality, and relevance. Each of these points will now be addressed. For each rejection under 35 U.S.C. 112, first paragraph (and the rest of the Examiner's rejections), the Applicant and the response below supplied by the Declarants fully and completely specify the errors in the rejection.

16. The Appellant below does fully and completely specify the many errors in the rejection, including how Appellant (then Applicant) timely provided evidence surmounting the Examiner's incorrect arguments, and how the Examiner is violating the normal standards of review to continue his systematic discrimination and Applicant-opposed dissection of the above-entitled invention. As such, the errors of the Office can be divided into three groups. First are those errors of the Office that involve the invention itself. Second are those errors of the Office which involve the art to which the Office does refer. Third, the Appellant will discuss, those errors of the Office which involve the Office deviating from the standards of review to continue its systematic discrimination against the pro se Appellant (then Applicant). In fact, as a result of ignoring his systematically ignoring submitted Evidence, the Examiner repeats again several general errors of fact, this time compounded into scientific errors and ethical errors (adding new material, for example). The general errors and the scientific errors are addressed in detail below, and again rebutted with specificity.

Fact 1 - The Specification of '691 Teaches and Claims an Operable Apparatus and a Method Compliant with 35 U.S.C. §112 First Paragraph.

17. The subject matter of the invention at issue in this case, '691, is derived as a Divisional from Applicant's invention '970, which was inappropriately, and mercilessly, dissected by Examiner Palabrica under protest by Applicant. The Examiner has sequestered the Appeal Briefs in '765 to prevent Appeal of this issue (and exposure of other matters, *vide infra*).

18. The above-entitled patent application is a Division forced by the Examiner against protest. In Serial no. 09/ 750,765 , a continuation of Serial no. 07/ 760,970, on September 4, 2003 the Applicant filed a notice of appeal about this issue. This most important issue is that Mr. Palabrica has been demanding double patenting (and five), with five times the application fees, and five times the Appeal fees, and he has never released a single Appeal Brief until this time. S.N.07/760,970 [now as Continuation '765, where the Appeal Briefs are sequestered by the Examiner since they expose his wrongful, cruel, unlawful behavior including removal of Evidence] involves a two-stage process involving loading of hydrogen into a metal electrode such as palladium. Applicant taught using a first stage of electrode loading, followed by, a second stage of sudden rapid ("catastrophic") flow of the loaded hydrogen within the metal. Applicant taught in the original specification and claims how this apparatus works and presented objective detailed evidence of the invention. The first stage is the electrode loading, and then, in the second stage a rapid ("catastrophic") flow of hydrogen results within the metal. After the initial loading, said flow (or flux) of hydrogen takes place until the previously-loaded palladium is spent of its deuterons or the material is otherwise damaged.

19. As the Appellant, then Applicant, said that it has been wrong for Mr. Palabrica

" to create needless confusion in an patent application or Court record. The identical original specification and drawings of Serial no. 07/760,970 have already gone through a restriction by the Primary Examiner Daniel Wasil on June 8, 1992. Mr. Wasil separated 07/760,970 into five inventions based upon accuracy and his wisdom. Mr. Wasil's 1992 restriction of 07/760,970 already created several inventions including "method for integrating plural fusion reactors". For example, based upon the case record, Applicant filed "METHOD AND APPARATUS TO INTEGRATE REACTORS INVOLVING REACTIONS WITHIN A MATERIAL", Serial no. 09/ 573,381, Filed: 05/19/2000, a division of Serial no. 07/ 760,970 Filed: 09/17/1991. The record demonstrates that this has been concluded. Simply put, Applicant notes that Examiner Palabrica has shown no basis whatsoever to replace years of communications, and a well-documented record involving

both the Board of Appeals and the Federal Court system and their Judgments, with his paroxysmal *de novo* and *nunc pro tunc* theory and comments --which are at variance with said record and said Judgments. These actions of Mr. Palabrica are consistent with his attempts to change the record and to obfuscate the case (infra). These are unethical and improper actions."

The Appellant (then Applicant) protested the Examiner because the restriction was not proper.

The Appellant (then Applicant) protested the Examiner because this restriction was improper in light of MPEP §808.01(a) because there was disclosure of a relationship between the method and apparatus in the above-entitled application. This relationship overcomes the election requirement because there is no "patentable difference" [MPEP §808.01(a)].

The Appellant (then Applicant) protested the Examiner because this restriction election was improper in light of MPEP 808.02 because the Examiner has not established reasons for insisting upon his latest restriction.

20. The subject matter is claimed by Claims 1, 5-8, 10-14, 21-30, and is a method to control the production of the desired products (such as heat) which includes in combination loading the hydrogen using a first applied electric field, and then at a later point in time applying a second electric field to redistribute said isotopic fuel within said material, with means to obstruct the flow of the loaded hydrogen. Each of these features, and those of the original specification of which this is the divisional has operability. The operability, and usefulness, of the original specification was demonstrated to be correct at the time of the original filing in Fusion Technology (of the American Nuclear Society) and elsewhere which demonstrate operability and utility [validation].

These include, but are not limited to, the following: Swartz, M.R. "Survey of the Observed Excess Energy and Emissions In Lattice Assisted Nuclear Reactions", Journal of Scientific Exploration, 23, 4, 419-436 (2009), Swartz, M., "Excess Heat from Low Electrical Conductivity Heavy Water Spiral-Wound Pd/D2O/Pt and Pd/D2O-PdCl2/Pt Devices", Condensed Matter Nuclear Science, Proceedings of ICCF-10, eds. Peter L. Hagelstein, Scott, R. Chubb, World Scientific Publishing, NJ, ISBN 981-256-564-6, Pages 29-44; 45-54, and 213-226 (2006), Swartz, 1998, Improved Electrolytic Reactor Performance Using p-Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85. These peer-reviewed publications prove Applicant was correct on the filing date of the application.

21. The Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection because there IS compliance with 35 U.S.C. §112, first paragraph. The Appellant submits that the first paragraph of 35 U.S.C. 112 is complied with fully and completely. The original specification described the subject matter defined by each of the rejected claims, and enables any person skilled in the art to make and use the subject matter defined by each of the rejected claims, and sets forth the best mode contemplated by the inventor of carrying out his invention. The original specification and claims complied and conformed with the Patent Act. Applicant has been willing to reveal to the public the substance of his discovery and "the best mode ... of carrying out his invention," 35 U.S.C. 112, and should be granted "the right to exclude others from making, using, or selling the invention throughout the United States," for a period of 17 years [35 U.S.C. 154]. In return, the federal patent system is supposed to encourage the creation and disclosure of new, useful, and non-obvious advances in technology and design in return for the exclusive right to practice the invention for a period of years [United States v. Dubilier Condenser Corp., 289 U.S. 178, 186 -187 (1933)] (***)

(* -- However, in the above-entitled application, the Applicant has received systematic harassment by certain individuals at the US PTO under color of Law. The Board and the American people know it, and the latter are getting weary of the obstruction of this safe, efficient, clean energy production technology and its transfer overseas by said obstruction.)**

Fact 2 - The Claims of '691 Have Operability, Define the Invention, And Are Compliant with 35 U.S.C. §112 First Paragraph.

22. The Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection because there IS compliance. The Claims of '691 do have operability, and clearly define the invention, and are compliant with 35 U.S.C. §112, First Paragraph (***) Clearly, one of the most important points rebutting the Office rejections under 35 U.S.C. 112, first paragraph is that the claimed invention should be the focus of the utility requirement.

"Each claim therefore, must be evaluated on its own merits for compliance with all statutory requirements" (MPEP 2107.01, I.).

(*) The appealed claims do not stand or fall together. claims 1, 10, and 21 are separately patentable and do not stand or fall together because they are materially distinct with respect to 35 USC 112 first paragraph. claims 1, 10, and 21 are separately patentable because they are not unduly multiplied, have separate limitations, and are required because the invention described by the original specification of the above-entitled application is very complex.**

23. As will now be demonstrated, each step is reasonable and has operability.
Independent Claim 1 claims

"(i)n a process for producing a product using a material loaded with an isotopic fuel, a method to control the production of said product".

Claim 1. In a process for producing a product using a material loaded with an isotopic fuel, a method to control the production of said product which includes in combination:

**applying an electric field to load said isotopic fuel to said material,
loading said isotopic fuel into said material,
applying a second electric field in a non-parallel direction to the first applied electric fields,
producing redistribution of said isotopic fuel within said loaded metal,
thereby controlling the product produced.**

Each step is reasonable and has operability.

24. The second line of the Claim 1 says:

"applying an electric field to load said isotopic fuel to said material,

Demonstrating operability, the original specification states (page 1, lines 10-12), ...
(t)he method and apparatus uses at least two non-parallel electric-fields to control the loading into the material and redistribution of the isotopic fuel within the material."

On reference to the figure, the original specification teaches (page 4, line 26 through page 5, line 3),

" ...label 1 represents the metallic cathode, usually palladium in the preferred configuration. ... The label 7 represents the anode which in the preferred embodiment is composed of palladium. The label 6 represents the solution consisting in the preferred embodiment of a gel containing antidesiccant, in combination with LiOD, palladium salts, and heavy water (D2O). "

25. The third line of the Claim 1 claim says:

"loading said isotopic fuel into said material,"

The original specification refers and teaches (page 5, lines 5-12), for those skilled in the art, .

"The power supply and control unit consists of a current source and reactor control device as described in Swartz (1989) ... capable of filling the cathode with deuterium from an aqueous solution, or one enabling deuterated metals loaded by codeposition of deuterium and palladium."

Demonstrating operability, the original specification teaches (page 5, lines 7-9),

"The application of said power source creates an applied electric field intensity which produces cation flow towards the cathode."

On reference to the figure 1, the original specification (page 5, lines 9-12), continues:

"There results in the near cathode solution (labelled as 5 in figure 1) a buildup of deuterons, and a low dielectric constant (gas bubble) layer. The bubbles are labelled as number 10 in figure 1. There may be spikes or on the cathode (labelled as 11 in figure 1)."

26. The fourth line of the Claim 1 claim says:

"applying a second electric field in a non-parallel direction to the first applied electric fields,"

On reference to the figure 2, the original specification teaches (page 5, lines 14-17),

"Figure 2 is a crosssectional drawing (t)his device has two orthogonal applied electric fields. The first (labelled E-field number 1 in the the figure) is that which is applied to charge the palladium with deuterons."

Demonstrating operability, the original specification continues (page 5, lines 17-22),

"The second applied electric field intensity is delivered after full charging has been achieved. In the figure the anode and cathode are labelled as 7 and 1. The electrolyte solution or gel is labelled as 6. The connections for the first electric field are labelled as 81 and 82. The connections for the second electric field are labelled as 85 and 86. The mechanical casing is labelled 20."

On reference to the figure, the original specification teaches (page 6, lines 7-13),

"Each device is equipped with orthogonal applied electric fields. The second applied electric field intensity is delivered after full charging. These devices each contain a cathode (labelled 1), intradevice gel containing lithium and palladium deuterioxide (labelled 6), and anode (labelled 7)."

27. The fifth line of the Claim 1 claim says:

"producing redistribution of said isotopic fuel within said loaded metal,"

Demonstrating operability, the original specification teaches (page 7, lines 1-4),

"The result is the piling up of deuterium at the deuterium-impermeable barriers (labeled 55). The heat energy is directed out via the the heat pipes and the thermal bus."

28. The sixth line of the Claim 1 claim says:

"thereby controlling the product produced."

Demonstrating operability, and on reference to the figure, the original specification teaches the heat product is removed (page 6, lines 26-28),

"Said apparatus has a thermal bus connected to the heat pipes which are held in a mechanical connecting system (labelled 20)."

29. Each step is able to each stand alone (MPEP 2111.02) with respect to operability. Compliance of this is obvious and demonstrated line by line. The result is the method to control the production of the desired products (such as heat) which includes in combination loading the hydrogen using a first applied electric field, and then at a later point in time applying a second electric field to redistribute said isotopic fuel within said material, with means to obstruct the flow of the loaded hydrogen. That has considerable utility.

30. Thus, the Examiner is shown to be wrong in this 35 U.S.C. §112, ¶1 rejection because Claim 1 distinguishes and limits the invention to a method to control the production of a product produced by a loaded material that includes applying an electric field to load said isotopic fuel into said material, loading said material with said isotopic fuel, thereafter applying a second electric field in a non-parallel direction to the first applied electric field, producing redistribution of said isotopic fuel within said loaded metal, thus, thereby controlling the product produced.

Similarly, the Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection because Claim 10 distinguishes and limits the invention to a method to control the production of a product produced by a loaded material that includes applying an electric field to load said isotopic fuel into said material, loading said material with said isotopic fuel, thereafter applying a second electric field in a non-parallel direction to the first applied electric field, thereby effecting redistribution of the fuel within said loaded material.

Similarly, the Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection because Claim 21 distinguishes and further limits the invention to a method to effect redistribution of an isotope of hydrogen in a material which includes applying an electric field to load said isotope of hydrogen into said metal, loading said metal with said isotope of hydrogen, thereafter applying a second electric field in a non-parallel direction to the first applied electric field, thereby distributing said isotope of hydrogen within said loaded metal.

Fact 3 - Peer-Reviewed Publications Demonstrate Operability and Prove Enablement

31. The Examiner is wrong in this 35 U.S.C. §112, ¶1 rejection because there IS operability. First, most importantly, the above-entitled invention works, is taught in the original specification, and is claimed by the claims. Second, that the Examiner is wrong is borne out *de jure* by peer-reviewed publications which have been submitted repeatedly (confer Exhibit "C" and "D"), have been removed and ignored repeatedly by some in the Office. Some of the submitted, ignored, relevant published papers include Swartz, M.R. "Survey of the Observed Excess Energy and Emissions In Lattice Assisted Nuclear Reactions", Journal of Scientific Exploration, 23, 4, 419-436 (2009), Swartz, M., "Excess Heat from Low Electrical Conductivity Heavy Water Spiral-Wound Pd/D2O/Pt and Pd/D2O-PdCl2/Pt Devices", Condensed Matter Nuclear Science, Proceedings of ICCF-10, eds. Peter L. Hagelstein, Scott, R. Chubb, World Scientific Publishing, NJ, ISBN 981-256-564-6, Pages 29-44; 45-54, and 213-226 (2006), Swartz, 1998, Improved Electrolytic Reactor Performance Using p-Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85.

32. These peer-reviewed publications include some published by the American Nuclear Society and the American Chemical Society, and like the ignored, timely-submitted Declarations, they establish facts. The published peer-reviewed scientific articles prove Applicant was correct on the filing date of the application -- and they demonstrate that growing numbers of the scientific community consider the positive results of Appellant's work as being operative and of utility. It is those individuals in the scientific community who actually research and write the scientific technical papers which undergo peer-review, file patent applications, and attend the Conferences who accurately evaluate inventions, products and publications. This community is defined as those "skilled in the art". They disagree with the Examiner's claim of putative lack of operability, and utility, of this invention.

33. NOTA BENE: Applicant's peer-reviewed publications submitted by the Applicant demonstrate validation, and fully address all matters criticized by the Office. They prove that the present invention was operable at the time it was filed. They are sufficient to convince one of ordinary skill in the art of the invention's utility. The peer-reviewed published papers also expose the Office's antiscientific discrimination regarding "cold fusion". These are the obvious, salient, reasons why they are ignored by the Examiner now, and removed from the file folder, previously.

34. Where are the Examiner's substantive responses to the Applicant's publications in peer-reviewed journals with evidence demonstrating that he has correctly taught operability and enablement regarding loading and loading flux? These include Swartz, M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4, "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research, and Swartz, M., 1997, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal of New Energy, 1, 4, 26-33, but also Swartz, M., 1998, Transactions of the American Nuclear Association, Nashville, 78, 84-85, Swartz, M., "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", *Fusion Technology*, 22, 2, 296-300 (1992), Swartz, M., "Possible Deuterium Production from Light Water Excess Enthalpy Experiments Using Nickel Cathodes", *Journal of New Energy*, 1, 3, 68-80 (1996), M. R. Swartz, "Generalized Isotopic fuel Loading Equations", *"Cold fusion Source book, International Symposium on Cold Fusion and Advanced Energy systems"*, Ed. Hal Fox, Minsk, Belarus, May (1994), Swartz, M., "Isotopic Fuel Loading Coupled to Reactions at an Electrode", Vol. 4, Proceedings: *"Fourth International Conference on Cold Fusion"*, *ibid.*, 33 (1994); Swartz, M., "ISOTOPIC FUEL LOADING COUPLED TO REACTIONS AT AN ELECTRODE", *fusion Technology*, 26, 4T, 74-77 (December 1994), M. R. Swartz, "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4, *Proceedings: "Fourth International Conference on Cold Fusion"*, sponsored by EPRI and the Office of Naval Research, December (1993).

35. As another example, where are the Examiner's substantive responses to the several other publications which the Applicant has published in *Fusion Technology* (of the American Nuclear Society) and elsewhere which demonstrate operability and utility [validation]? These include, but are not limited to, the following: Swartz (1998), Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85, Swartz. (1997), *Fusion Technology*, 31, 63-74, 1997, Swartz (1999), "Generality of Optimal Operating Point Behavior in Low Energy Nuclear Systems", *Journal of New Energy*, 4, 2, 218-228 (1999), Swartz, 1997, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", *Fusion Technology*, 31, 63-74, Swartz, 1998 "Optimal Operating Point Characteristics of Nickel Light Water Experiments", "Proceedings of ICCF-7", and Swartz, 1997, "Biphasic Behavior in Thermal Electrolytic Generators Using Nickel Cathodes", IECEC 1997 Proceedings, #97009; Swartz, 1998. Where is the Examiner's Response to Swartz, 1998, Improved Electrolytic Reactor Performance Using π -Notch

System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85?

36. As another example, where are the Examiner's substantive responses to the Applicant's teachings of errors and artifacts which can give rise to false indications of "excess heat", Applicant's teachings of the analysis and measurement of thermal noise (Swartz 97B, Swartz 97F, Swartz 97D), means of calibrating said signals for long term analysis (Swartz 97E, Swartz 97D, Swartz 97C, Swartz 96C), correction for Bernard instability (Swartz 96D), correction for said noise (Swartz 97F), and for other types of artifactual signal (Swartz 97C, Swartz 96A, Swartz 94C, Swartz 94D).

37. As another example, where are the Examiner's substantive responses to the Applicant's publications in peer-reviewed journals which have taught standards and quality control ("Q/C") which are relevant to experimental operability? These include Swartz, 1997 ["Patterns of Failure in Cold Fusion Experiments, Proceedings of the 33RD Intersociety Engineering Conference on Energy Conversion, IECEC-98-I229, Colorado Springs, CO, 1998], Swartz 1996 ["A Method To Improve Algorithms Used To Detect Steady State Excess Enthalpy", Transactions of Fusion Technology, 26, 156-159], but confer also SWARTZ, "IMPROVED CALCULATIONS INVOLVING ENERGY RELEASE USING A BUOYANCY TRANSPORT Corrections", Journal of New Energy, 1, 3, 219-221 (1996); Swartz, "Potential for Positional Variation in Flow Calorimetric Systems", Journal of New Energy, 1, 126-130 (1996)]; SWARTZ, "DEFINITIONS OF POWER Amplification Factor", J New Energy, 2, 54-59 (1996); Swartz, "Explanations for Differences Between Reports of Excess Heat in Solid State Fusion Reactions", J. New Energy, 2, (1997); Noise in Cold Fusion Systems", J. New Energy for Fall 1997; Swartz, "Relative Impact of Thermal Stratification", J. New Energy, 1, 2, 141-143 (96)); SWARTZ, "SOME LESSONS FROM OPTICAL EXAMINATION OF the PFC Phase-II CALORIMETRIC CURVE", Vol. 2, Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research, December (1993), published July 1994).

38. The Examiner has not been fair in this matter. There has never existed a single honest reason to doubt any one (1) of the objective unbiased observers of the objective truth, who wrote averments corroborating support of Applicant. In this case, given the submitted [and received] Declarations, reason never existed doubting the objective truth of the statements relied on for enabling support. Therefore no basis exists for a rejection under either section 112, ¶1 for lack of enablement as a result of "the specification's ... failure to disclose adequately to one ordinarily skilled-in-the-art 'how to use'

the invention without undue experimentation," or section 101 for lack of utility "when there is a complete absence of data supporting the statements which set forth the desired results of the claimed invention." [Environtech Corp. v. Al George, Inc., 730 F.2d 753, 762, 221 USPQ 473, 480 (Fed. Cir. 1984); also In re Brana, 51 F.3d 1560, 1564 n.12, 34 USPQ2d 1436, 1439 n.12 (Fed. Cir. 1995)].

39. Given the multiply destroyed/removed/sequestered/"lost" peer-reviewed publications submitted, the Examiner's action is inconsistent with the reasoning of In re Vaeck [947 F.2d 488, 495-96, 10 USPQ2d 1438, 1444 (Fed. Cir. 1991)] which states that an enablement rejection under section 112, ¶1 is only appropriate where the written description fails to teach those skilled-in-the-art, like the Declarants, to make and use the invention.

40. **The Appellant would like to know how many of Applicant's publications does it take in prestigious peer-reviewed journals before the Office (or Examiner) accepts the clear, substantiated, evidence that a technology exists?** Applicant's publications in peer-reviewed journals confirm operability as taught years earlier in the original specification and claims.

Undisputed Fact: Declarations Confirm Compliance with §112 First Paragraph

Fact 4 - '691 Has Operability Based Upon the Declarations

41. That the Examiner is wrong is also corroborated *de facto* by the submitted, and ignored, Declarations. The peer-reviewed publications, open demonstrations, and Declarations demonstrate the existence of lattice assisted nuclear reactions including the generation of heat. Nothing of substance or scientific foundation has been presented by the Office or other Art which rebuts the content of the above-entitled application OR the Declarations or the Amicus Curiae Briefs of Straus, Chubb, Mallove, Fox, and Valone. Nor has the Examiner presented any argument of substance to support his incorrect, proven-wrong, notions with respect to any of the matters discussed therein. The pro se Appellant cites, and cited, said Declarations from '970 and the other cases before the Board.

42. The above-entitled invention, '691 (like '970 before it and from which it is a continuation in part by demand of the Examiner Palabrica) has operability and utility. This is confirmed by un rebutted, important Declarations and Amicus Briefs which the Applicant has submitted and referenced. The Declarations contain factual statements which detail rebuttals to the Office and support the Applicant's position. The

Declarations constitute significant reputable evidence of record and a bona fide case which is quite convincing and persuasive to one who is open-minded and not biased.

43. Applicant's Declarations show precisely that the Examiner is inaccurate on issues of operability, refute all of his points of rejection, and substantially, completely and fully address and precisely dispute all of the Examiner's points of rejection and all matters criticized by the Office. They also prove the Office's hostile and discriminatory notions are wrong in this matter.

44. Said Declarations document Applicant's demonstrations of the Applicant's invention, including one open to the public, at the Massachusetts Institute of Technology [Cambridge, MA] for a week before hundreds of people. They support that the invention DOES operate as indicated. They prove that the specification adequately described the subject matter recited in the claims and demonstrate that it operates as stated. The Declarations prove that the adequately written description requirement is met and demonstrate that the teachings of this invention are sufficient for one skilled-in-the-art to have understood the inventor to have been in possession of the claimed invention at the time of filing.

45. Said Declarations demonstrate validation, operability, considerable utility, and therefore enablement of the present invention and Applicant's claimed subject matter. They indicate that the teachings in the original specification, claims, and drawings are sufficient and convincing to one of ordinary skill in the art -- heralding operability and conformity and compliance with the 35 U.S.C. §112, §1 (first paragraph) and the "enablement" requirement. Validation occurs when scientists skilled in the state of the art states it is so. These Declarations indicate that the measurement of activity has utility, and the precise invention has operability. The Office corruptly ignored the testimony in the past, allowing several Declarants to die (Drs. Scott Chubb and Eugene Mallove, for example) without their words having even been fairly read.

46. Proof of operability and utility are sufficient if convincing to one of ordinary skill in the art [In re Irons, 52 CCPA 938, 340 F.2d 974, 144 USPQ 351 (1965)], the Declarations of so many. Said Declarations were received by the Office and have been systematically ignored. Said Declarations fully addressed all matters criticized by the Office regarding operability and utility, substantially and fully. Several Affiants even described the week long open demonstrations of Applicant's technology at the Massachusetts Institute of Technology in the Electrical Engineering building in August 2003 during ICCF-10. They confirmed the above-entitled invention's operability, definiteness and utility consistent with requirements [In re Gazave, 379 F.2d 973, 978, 154

USPQ 92, 96 (CCPA 1967); In re Chilowsky, 229 F.2d 457, 462, 108 USPQ 321, 325 (CCPA 1956); In Re Jolles, 628 F.2d 1322, 206 USPQ 885 (CCPA 1980).

47. Said Declarations remain ignored in the their factual content because they refuted the Offices' erroneous position. Said Declarations proved that the present claimed invention measures activity and meets at least one stated objective, and therefore utility under 101 is clearly shown [Standard Oil Co. (Indiana) v. Montedison, S.P.A., 664 F.2d 356, 375, 212 USPQ 327, 344 (3rd Cir. 1981), cert. denied, 456 U.S. 915, 102 S.Ct. 1769, 72 L.Ed.2d 174 (1982); E.I. du Pont de Nemours & Co. v. Berkley & Co., 620 F.2d 1247, 1258 n. 10, 1260 n. 17, 205 USPQ 1, 8 n. 10, 10 n. 17 (8th Cir.1980); Krantz and Croix v. Olin, 148 USPQ 659, 661-62 (CCPA 1966); Chisum on Patents, 4.04[4] [1983]; RAYTHEON COMPANY v. ROPER CORPORATION, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592].

Fact 5: The Skilled-in-the-art Support Applicant

48. Where is the Examiner's substantive response to Applicant's cited Declarations, including the the Swartz declaration, the Declaration of Straus (4/22/94), and the *Amicus Curiae* Briefs of Drs. Edmund Storms (2/21/01), Talbot Chubb (2/22/01), Eugene Mallove (3/24/00) and Hal Fox (2/21/01)? In the new arguments made by the Office, there is no substantive response or answer to the Declarations previously submitted with the Applicant's last Communication to the Examiner even though the Affiants addressed operability and utility of this invention, and even though said Declarations were referred to and addressed several times by Applicant. The Office fails to indicate which, if any, of the averments (or pages) in the Declarations and *Amicus Curiae* Briefs have been formally considered by the Office and, if so, how they reached their conclusion.

49. The Declarations are evidence supporting the Applicant's position, and substantially and fully address all matters and issues criticized by the Examiner, and contain averments regarding evidence establishing the utility, validation, and operability of the Applicant's claimed subject matter. The Declarations contain factual statements directly addressing how the specification adequately described the subject matter recited in the claims. They demonstrate that a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, and that the invention operates as stated, and as explicitly taught in the original specification and claims. The Declarations prove that the Applicant taught in the original specification and claims how his apparatus works and claimed the invention.

50. The Affiants, skilled-in-the-art, state that the "environment" in which the above-entitled invention operates "does exist" and that there is no evidence of "heat" and "loading". The Declarations include the Straus (4/22/94), Swartz, and other Declarations, including but not limited to the Amicus Curiae Briefs of Edmund Storms (2/21/01), Talbot Chubb (2/22/01), Eugene Mallove (3/24/00) and Hal Fox (2/21/01) and Affiants who have been the Office's own witnesses.

51. As the Amicus Curiae Brief of late Eugene F. Mallove, Sc.D (Editor, New Energy Research Laboratory, NH) has stated,

"The most notable characteristic of the attack against the Swartz patent application at hand is its stale fixation with misrepresented events of 1989, its citation of erroneous reports, and its continued argument from supposed authority, rather than from evolved science and meticulous experiment."

52. As the Prof. Hagelstein's (MIT, Cambridge) Declaration states,

"Today, D/Pd loading is known to be very important. There have been numerous peer-reviewed published papers that show positive excess heat results in replications of the Fleischmann-Pons experiment. If the USPTO have asserted otherwise, they are simply mistaken."

53. As the late Dr. Scott R. Chubb has said in '970:

"the patent office (PTO) has ignored the facts involving the present invention, ... The patent application provides a well-defined procedure, understandable by anyone skilled in the art, that can be used to implement the invention. ... It is evident that the patent office has become recalcitrant, with its opinion in contradiction to existing evidence as promulgated through peer-reviewed literature."

"Dr. Swartz has invented an important, new device, whose purpose has value for measuring activity of a sample. ... I assert that the PTO has failed to distinguish between the very different sets of claims associated with measurements of high energy particles and those involving excess heat."

[Declaration of Dr. Scott R. Chubb (8/2001)]

54. Corroborating the above, Dr. Hal Fox has said:

"It is my professional judgment that the method of measuring the activity of sample in the above-entitled action is clever, not obvious, and is an important invention with utility. ... The rejection has ignored numerous filings delivered to the Patent Office by Dr. Swartz and others. ... It is not credible that hundreds of scientists and inventors are all mistaken in their experiments and data, or that only the patent examiners are sufficiently educated to point out the faults of these inventions."

[Declaration of Dr. Hal Fox (8/2001)]

55. The Office's own witness in '457, Dr. Michael Schaffer (cited in the Exhibit supplied with the rejection) rebutted the USPTO and said:

"I do not see how anyone could construe anything that I wrote at Scientific American's site to imply that there is "no utility" in cold fusion, much less in instruments that might be used in cold fusion and other scientific experiments."

"It appears that the Board of Patent Appeals considers me an expert on this subject. As an expert ... I would agree [Dr. Swartz's invention] ... does does have utility"

• [Letter of Michael J. Schaffer (8/7/2001)]

56. In the international community, Dr. McKubre is among the most highly regarded of those skilled in the art. Dr. McKubre stated:

"For me ... perhaps the best report at this conference, was that of Mitch Swartz. ... I have always felt that the quality of the calorimetric observations in the nickel light water studies has been less than the quality of the calorimetric observations in the palladium-deuterium system. ... Mitch Swartz presented a very clear piece of calorimetric evidence which is certainly going to cause me to reconsider my belief and understanding of the nickel-light water system and its capacity to produce anomalous heat" [Dr. Michael McKubre, SRI, at his closing "Summary During ICCF-7", Infinite Energy, 4, 20, pp. 34-35, (1998)]

57. As the Prof. Hagelstein's (MIT, Cambridge) Declaration states,

"The scientific results presented by Dr. Mitchell Swartz on his Phusor experiments, in which excess power and total energy is measured, looks very good. His results are competitive in terms of reproducibility and power gain with the best results obtained by other groups around the world. The reproducible en-ergy gains that he has reported are the highest so far reported by any group."

"Water heaters that run on electricity from household wall plugs are currently sold to produce hot water in parts of the country where oil delivery and natural gas delivery are unavailable or inconvenient. Electricity in the Boston area costs near \$0.20/kW-hr, which seems very expensive. Swartz's Phusor ex-periments have shown energy gains at least up to 10x. A Phusor-based water heater with an energy gain of 10x would be competitive with existing water heaters. I would buy one if available."

58. As the Prof. Hagelstein's (MIT, Cambridge) Declaration states,

"No one in the field considers Swartz's Phusor experiment to be the same as what Fleischmann and Pons did, or what others have done. It is clearly an original experiment distinct from all that have come before. The USPTO is simply mistaken if they assert otherwise. The specification of "low paramagnetic, low conductivity deuterium oxide, 99.99%, from Cambridge Isotope Laboratories, Andover MA" adequately specifies what is meant by pure heavy water in the context of Swartz's Phusor experiment. Assertions to the contrary in this case by the USPTO are incorrect."

59. As the Prof. Hagelstein's (MIT, Cambridge) Declaration states,

"Swartz demonstrated his Phusor experiment at MIT in connection with ICCF10 in August 2003. Data from this experiment show significant excess heat. Swartz has demonstrated his Phusor experiment in his Weston laboratory, in Weston, MA numerous times for me and for others."

60. As the Dr. Brian Ahern (ret. Air Force, MIT) Declaration states,

"I have known Mitchell Swartz since 1991. I would like to express my strong support for the work being conducted by Dr. Mitchell Swartz in the field of isotopic fuel loading of metal lattices and lattice assisted nuclear reactions. I believe his investigations are some of the most thorough and precise yet conducted in isotopic loading and lattice assisted nuclear reactions, and that the thermal effects he is observing are real and will ultimately be useful on a large scale."

61. This submitted Evidence includes the following Declarations and other testimony. The Applicant has presented at ICCF-10 [Cambridge, MA; to which the Examiner and the Office's counsel were invited (through said counsel), but did not attend] other technologies in this field, including an open demonstration for a week. This was covered around the world (all documents fastidiously removed at the USPTO).

"Dr. Mitchell Swartz's Fleischmann/Pons-type electrolytic palladium Phusor/low electrolyte conductance heavy water/platinum cell performed flawlessly in Prof. Hagelstein's lab at MIT during ICCF10. Its excess power ranged from 167% to 267% as Dr. Swartz altered the experimental conditions."

[Dr. Eugene Mallove, Infinite Energy Magazine 9/2003]

"Greetings. I am back from ICCF-10 ... Swartz, and Dash et al., live demonstrations at MIT. Marvelous work! Bravo to everyone! McKubre said he would never have the guts to try this, because so much can go wrong when you move an experiment."

[Jed Rothwell, Subject: Impressions of ICCF-10, 3 Sep 2003]

"Three excess heat experiments were shown in live demonstrations at ICCF10, including two on August 26, in a laboratory at MIT that was open to the public: A cell in a precision calorimeter was shown by Mitchell Swartz and Gayle Verner at MIT."

[<http://lenr-canr.org/iccf10/iccf10.htm>]

And yet as another example:

"La dixième conférence internationale sur la fusion froide ICCF10 s'est tenue à Boston aux Etats-Unis, du 24 au 29 août 2003. 120 personnes de 15 nationalités différentes y ont participé. Elle était organisée par le Professeur Peter Hagelstein, du MIT. ... "Deux démonstrations de fusion froide ont été présentées : l'une par le professeur John Dash de l'université de l'Oregon à Portland, et l'autre par le Dr Mitchell Swartz. Les deux expériences ont démontré la production d'excès de chaleur. ... M. Swartz a obtenu de forts excès de chaleur, jusqu'à 300% avec de l'eau lourde ultra pure de résistivité 220 k?, sans rajout d'électrolyte, avec cathode de palladium hélicoïdale. "

[Rapport sur L'International Conference on Cold Fusion ICCF10]

62. **NOTA BENE:** Several of the Office's "witnesses" have thereafter taken the time to write Amicus Curiae Briefs and letters to the effect that the Examiner has absolutely misstated what they wrote or implied. Other Declarants have stated that the Office is wrong. All have been impugned, ignored, or relegated improperly to 'opinion' and the wastebasket. How many decades must witnesses be ignored by the Board of Patent Appeals during an energy crisis that began with the Exxon Valdez and continues to this day?

Fact 6 - The Rule 'One Declarant Being Sufficient' is Ignored by the Office

63. Exactly how many Declarants does it take to overcome the Examiner's unsubstantiated rejection? The answer is simple. The answer is quantitative. The answer, by the Examiner(s), is ignored. The answer is one (1). Operability and Utility are fact questions. Proof of utility is sufficient if it meets at least one stated objective. In this case, it does. In this case, given the averments of so many Declarants, utility under USC 101 is clearly shown. The Examiner has ignored that the patent application has met at least one (1) stated objective [Standard Oil Co. (Indiana) v. Montedison, S.P.A., 664 F.2d 356, 375, 212 USPQ 327, 344 (3rd Cir. 1981), cert. denied, 456 U.S. 915, 102 S.Ct. 1769, 72 L.Ed.2d 174 (1982); E.I. du Pont de Nemours & Co. v. Berkley & Co., 620 F.2d 1247, 1258 n.10, 1260 n.17, 205 USPQ 1,8n10,10n.17 (8th Cir. 1980); Krantz and Croix v. Olin, 148 USPQ 659, 661-62 (CCPA 1966); Chisum on Patents, 4.04[4] [1983]; RAYTHEON COMPANY v. ROPER CORPORATION, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592].

The Applicant would like to know how many Declarations does it take before the Office (or Examiner) accepts the clear, substantiated, evidence that a technology exists? The law says one. The Examiner will not answer and ignores dozens of Declarants, although he never taken an Oath himself and has been shown to be thoroughly disingenuous.

CONCLUSION: The Declarations remain ignored in their factual content because they rebut the Offices' erroneous position about operability and utility. Validation occurs when scientists actually skilled, and working, in the state-of-the-art state it to be so. Scientists write the technical papers which undergo peer-review, file the patents applications, and attend international conferences, disagree with the Examiner. Given that in this case there has been no response to, or dispute of, said Declarations the Office is obligated by law to assume that all Declarants assertions are true [Lewis v. Bours, 119 Wn.2d 667, 670, 1992], and therefore, the Examiner has erred by failing to consider those skilled-in-the-art who counter the rejection under 35 U.S.C. §112 and §101.

Fact 7 - Declarant's Statements Wrongly Called 'Opinion' by the Office

64. The Examiner cannot dismiss Declarations improperly to "opinion"-status without an adequate explanation of how the Declarations failed to overcome the prima facie case initially established by the Examiner. The Examiner's error becomes further unlawful because the Examiner has also rejected In re Alton which requires that even the use of the words "it is my opinion" to preface what someone of ordinary skill in the art knows does not transform the factual statements contained in the declaration into opinion testimony.

Undisputed Fact: Operability and Utility of This Invention Are Independent of Cold Fusion and Excess Heat

Fact 8 - Operability and Utility of This Invention Are Independent of Cold Fusion and Excess Heat

65. The Examiner is wrong because the invention works even without the need for cold fusion. First, it says so right in the original specification. Despite that, the Examiner and Office continue the vilification of the Applicant and his invention by linking it to "cold fusion". It is obvious that this is so that the Examiner can cite every mean, irrelevant, immaterial reference he can find. The problem is that the Examiner's notion is wrong. First, the invention works in other, non-cold fusion environments, too; and with great utility.

66. Second, attention of the Examiner, Court and Board is directed to the fact that Claim 1 distinguishes and limits the invention to a method to control the production of a product produced by a loaded material that includes applying an electric field to load said isotopic fuel into said material, loading said material with said isotopic fuel, thereafter applying a second electric field in a non-parallel direction to the first applied

electric field, producing redistribution of said isotopic fuel within said loaded metal, thus, thereby controlling the product produced. Controlling reactions, chemical, medical, and otherwise, have been used for centuries by academicians, physicians, and the military even before the reactions have been understood. Consider, just controlling heart beat through gait. That was designed before it was even known what a muscle or heartbeat even consisted of. Therefore, it is not logically necessary for Applicant in this case to argue the merits of cold fusion as it was known in 1989, or in 2011, or even issues of it associated with heat. The applicant is simply claiming a method to control the production of a product produced by a loaded material that includes applying an electric field to load said isotopic fuel into said material, loading said material with said isotopic fuel, thereafter applying a second electric field in a non-parallel direction to the first applied electric field, producing redistribution of said isotopic fuel within said loaded metal, thus, thereby controlling the product produced.

Fact 9 - Examiner Relies on Cloth Cut of Other Art

67. The Examiner is wrong because the Examiner wrongly, incorrectly, and maliciously, presumes that THIS invention is the same as used by Drs. Fleischmann and Pons (hereinafter F+P), and uses it as a segue to ignore THIS application. The Examiner then takes this unlawful "leap of faith" on reference to other irrelevant, immaterial art ("FP" or "F+P") while systematically ignoring Appellant's (then Applicant's) submitted original specification, Declarations, and publications [Exhibits which prove the Office wrong, disingenuous, and (after two decades, simply) malicious]. The cited art pointed to by the Examiner is not relevant for any of several reasons. The cited art utterly fails to describe THIS invention. Also, the "standard theory" does not even mention the lattice, which the Applicant and others have now proven to be significantly important.

As shown below, the Examiner and Office are illogically attached [if not fixated; confer the Ahern Declaration] to Drs. Fleischmann and Pons (hereinafter "F+P", or "FP") as they demean them, and indirectly by innuendo, the Appellant (then Applicant). The Examiner's references do not apply to the present invention, but rather are criticism of other work in the field, "FP" (for Drs. Fleischmann and Pons), or involve experiments which were not done using the techniques taught in the original specification and claims of the above-entitled application (thereby actually indirectly proving the utility of the present Applicantion). The Examiner deviates from the present invention, and upon his systematic inaccurate and improper reference to other art ("FP" or "F+P") which he purports did not exist or was flawed, again makes a false segue to attempt to invalidate the Applicant's independent work over more than twenty

three years which has been described in more than sixty papers in peer-reviewed scientific journals.

68. The Office is unfair, and cruel to ignore rebutting Evidence. The Law states that enablement must be judged on this original specification and claims. The present invention is not the work of Pons and Fleischmann or their subject matter. Despite the serial disingenuity of the Office, the Applicant's original specification and Claims in each case taught the subject matter defined by each of the rejected claims, set forth the best mode contemplated with an adequately written description of how to operate the invention, so that an artisan or those skilled-in-the-art, could practice it without undue experimentation, and distinctly pointed out and claimed the subject matter which constitutes the invention. These teachings were precise, clear, and unambiguous to a person skilled in the art, and adequately presented so that an artisan could practice it without undue experimentation [cf. Declarations and Amicus Curiae Briefs]. The Examiner's continual referral to other much less relevant art is not really a rebuttal of this invention, but is a prejudicial attack against the Applicant, in disguise despite the Examiner's handwaving otherwise.

Fact 10 - In all Applicant's Applications, the Office Claimed Applicant's Inventions are 'F+P'

69. The Office and Examiner have also been inaccurate in all other of Applicant's inventions in this field. Every single one The response of the Office to the Applicant's detailed efforts has been to issue flawed 'boiler plate' denials Constitutional rights while IGNORING EVIDENCE. The issue is that other peoples' work is not relevant to this specific invention. Instead of addressing the invention as it was actually taught in the original specification and claims, the Office has solely relied upon reference to art cut of a cloth other than the original specifications and the Claims. So, for two decades, no matter which of the Applicant's invention's in this field has been "examined", there has been essentially one, and only one, response from the USPTO. It is F+P.

The Applicant's above entitled invention? The USPTO says it is F+P.

The Applicant's cathode vibrator to measure loading? The USPTO says it is F+P.

The Applicant's generation of electricity? The USPTO says it is F+P.

The Applicant's system to assemble multiple LANR systems? The USPTO says it is F+P.

The Applicant's use of increasing temperature to trigger reactions? The USPTO says it is F+P.

The Applicant's optimal operating points? The USPTO says it is F+P.

The Applicant's system to increase tardive heat? The USPTO says it is F+P.

The Applicant's multiring calorimeter? The USPTO says it is F+P.

The Applicant's use of microwave radiation? The USPTO says it is F+P.

The Applicant's use of nickel metamaterials with ultrapure water? The USPTO says it is F+P.

No matter what the Applicant's invention, there is one response from the USPTO. The USPTO says it is F+P.

70. It is an uncontested fact that the ONLY claimed invention should be the focus of the Office review. Enablement must be judged on this invention's original specification and claims. In this case, to harass the Applicant and deny his civil and Constitutionally-protected rights, and deviating from the normal standards of review, the Examiner and the Office have misread the invention '691, just as it did '457 and '970 and all the others before it. To allow this charade to continue, the Examiner and the Office have systematically misdescribed Appellant's inventions while failing to respond to submitted Declarations and publications in this invention '691, just as it did '457 (confer Exhibit "F") and '970 (from which the present Continuation-in-part is derived), and '258 (a case which was before the Board and about to return) and all the others before it. This will be shown with multiple examples.

IMPORTANT CONCLUSION: If the Examiner must rely upon reference to art cut of a cloth other than this specification and claims, then his position must indeed be quite weak.

Fact 11 - As Another Corroborating Example, in '457 the Office Solely Relied on Cloth cut of Other Art

71. As just one example, in the past, in '457, Applicant's invention, a novel calorimeter (a heat-measuring instrument) and a "method to ... characterize (a) sample", the invention was NEVER discussed. The Office ignored the evidence, ignored the invention, and "hand waved" away from '457, now 058, instead pointing to 'cold fusion' as if it were a forbidden word. But it was wrong. Cold fusion was merely one of several scientific and research environments in which the present invention finds utility. Only by such improper action as systematically ignoring evidence can the Office and Board purport that this invention has no utility.

Attention of the Court and Congressional review are directed to the Proof; and there is much of it. Although '457 is a novel calorimeter (a heat-measuring instrument) and a "method to ... characterize (a) sample", absolutely none of the words which encompass the invention and the claims were EVER mentioned in the Decision from the Board of Patent Appeals in '457. Instead, the Decision of the Board inaccurately

substituted the words "cold fusion" repeatedly for the words "heat production", and for the word "activity", and for the words "electric power drive", and for "thermally monitoring", "thermal output", "optimum drive condition", and even for "multiring calorimeter". Documenting this, the egregious Decision (simply rubberstamping false statements from the Examiner) referred to "cold fusion" eighty-six (86) times. But the truth is that the words which defined '457 and '058, like "thermal output", "thermally monitoring", "electric power drive", "optimum drive condition", and "multiring calorimeter" were never even used once, not one time, in the Decision.

72. In '457, nothing in the rejection addresses or discusses the invention, which is the same as the present, above-entitled invention. This is saliently demonstrated as follows. In '457, the equivalent claim to Claim 1 in '058, was Claim 13. It described "a method to determine the optimum electrical drive condition for said sample and thereby characterize said sample". The invention is used to "measure activity" which REFERS TO the measurement of HEAT GENERATION from a sample, as discussed in the original specification and claims including in FIGURES 5, 6, 7. In '457, attention is directed to the fact that although the invention is used to "measure activity", that is discussed in the rejection zero (0) times. Similarly, the key features of claim 13 are each absolutely and totally ignored in the egregious rejection.

Claim 13 teaches and claims "thermally monitoring", but the rejection discussed that zero (0) times.

Claim 13 teaches and claims "electric power drive", but the rejection discussed that zero (0) times.

Claim 13 teaches and claims "thermal output", but the rejection discussed that zero (0) times.

Claim 13 teaches and claims "optimum drive condition", but the rejection discussed that zero (0) times.

Claim 13 teaches and claims "multiring calorimeter", but the rejection discussed that zero (0) times.

By contrast, the rejection discussed "Huizenga" (on reference to other book) thirteen (13) times.

By contrast, ignoring the present invention and claims, the rejection elects to only focus on "cold fusion" which it mentions eighty-six (86) times.

◆

Fact 12 - The Office's Reliance on Cloth Cut of Other Art Is Not Lawful

73. The Office's unsubstantiated claim that the invention lacks operability is always imagined by the Examiner based upon his excluding Applicant's submissions and replacing them solely with other peoples' work, such as F+P. That is not proper.

Attention of the Court and Congressional review are directed to the fact that even now --22+ years after FP, the Office still, always drifts toward criticism of "FP". The present invention is NOT the work of Pons or Fleischmann despite the Examiner's innuendo. This demonstrates systematic discrimination by the Office and the Examiner(s) against the Appellant for reasons unclear, under color of Law, to deny justice, and on information and belief, to enable transfer of the technology to other countries overseas.

74. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected MPEP §2111.01. The Office's rule [M.P.E.P. §2111.01] requires that "the words of a claim ... must be read as they would be interpreted by those of ordinary skill in the art".

75. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Fouche* [439 F.2d 1237, 1243, 169 USPQ 429, 434, (CCPA 1971) and *In re Zletz* [893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989)] which state that an invention (in structure, operation and composition) is defined by the claims and the original specification.

76. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Morris* [also *Ex parte Porter*] because the interpretation of an issue of fact, like operability, must read on the original specification and claims and be predicated upon the Declarations to a conclusion consistent with what one who is skilled-in-the-art would reach.

77. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Zletz* [893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989)] because the specification clearly and explicitly stated the meaning of the terms in the claims which means that the invention is a method to measure activity.

78. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Prater*, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969)] which requires the Examiner to refer to the claimed invention as the focus of its Office communication, but he has not by drifting toward criticism of "FP" again while ignoring all the figures and all the data and all the information in the application. It is unfair for the PTO to repeatedly weave systematic misstatements into its imagined cloth cut of other art.

79. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Hogan* [559 F.2d 595, 60S, 194 USPQ 527, 537 (CCPA 1977)] which discusses that enablement must be judged on the original specification and claims.

80. By ignoring the description of this patent and focusing on "F+P", the Examiner has ignored and rejected the reasoning of *In re Ziegler* [992 F.2d 1197, 1200, 26 USPQ2d 1600, 1603 (Fed. Cir. 1993)] because the notion that the written description fails to illuminate a credible operability can only be made, by not reading on the claims of this patent. However, it is below the standards of review to solely use cloth cut of other art because the invention (structure, operation and composition) is defined by the claims and the original specification. This leading away from the actual original specification and claims by the Office herald bias by the Office rather than proper application of the standards of review.

81. The Examiner's action are improper and unlawful, in violation of *Newman v. Quigg* [877 F.2d 1575, 1581, 11 USPQ2d 1340, 1345 (Fed. Cir. 1989)] because the Office derides the present invention with reference to cold fusion but, in fact, Claim 1 (and the other claims) is a method for a monitoring loading. Such (well-known) "boilerplate" attacks by the Office on the words "cold fusion" is well-known [confer Bass, Rotegard, and Mallove Declarations, and the Valone, Fox, and Mallove Amicus Curiae Briefs]. As the Amicus Curiae Brief of Eugene F. Mallove, Sc.D (Editor, New Energy Research Laboratory, NH) has stated,

"The most notable characteristic of the attack against the Swartz patent application at hand is its stale fixation with misrepresented events of 1989, its citation of erroneous reports, and its continued argument from supposed authority, rather than from evolved science and meticulous experiment."

Fact 13 - The Office's Continual, Unmitigated Reliance on Cloth Cut of Other Art is Discriminatory

82. By perpetually invoking "F+P" and art cut of other cloth than the present invention, the Examiner and Office needlessly use a broad brush, apparently with tongue in cheek, to deliberately mislead away from the above-entitled invention. Such handwaving to other much less relevant art is not a fair or proper rebuttal. The present invention is NOT the work of Pons or Fleischmann, and so it is salient that this is done to confuse the issue, as the Examiner systematically deviates from the present invention and refers ONLY to other art, located far from the present invention.

Simply put, the Office's continual, unmitigated reliance on cloth cut of other art is discriminatory and targeting the Applicant.

83. The 35 U.S.C. § 112, ¶ 1 rejection is wrong because there is operability under, and compliance with, 35 U.S.C. 112, first paragraph. The specification provides an adequately written description of the invention and does adequately teach how to make and use the invention, thereby providing an enabling disclosure. The claims and specification do comply with the enablement requirement. The specification did contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and the Appellant (then Applicant) set forth the best mode contemplated by the inventor of carrying out his invention. The specification does contain subject matter which was described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Fact 14 - Reference to Art Cut of Cloth other than this Specification Should Dictate Allowance

84. The endless use by the Office of citing other people's art (F+P over and over) instead of the above-entitled invention is utterly wrong. Despite the innuendo and claims of the Examiner and the Office, for the above-entitled invention, cold fusion and excess heat are not even necessary. Appellant submits that if the Office must rely upon reference to art cut of a cloth other than this specification and claims, then their position must indeed be rather weak and should dictate allowance of the present invention.

THE OFFICE IS DISINGENUOUS REGARDING LANR/CF

85. The Examiner states,

"This concept of producing nuclear reactions by "cold fusion" was, in general, publicly announced by Fleischmann and Pons (hereinafter referred to as "F and P") this "cold fusion" concept of producing nuclear reactions is still no more than just an unproven concept many laboratories have attempted to confirm the results of F and P. results of these attempts at confirmation were primarily negative"

This statement by the Office is disingenuous in many ways.

1. CF/LANR is real, but is not needed for the above-entitled invention, although it works in that environment quite well, too.
2. F+P is not the above-entitled invention, and irrelevant criticism of F+P is unfairly thrown up by the Office even when rebutted by peer-reviewed publications and Declarations.

OFFICE IGNORES DECLARATIONS

86. The Dr. Ahern Declaration states,

"It is my professional as well as personal opinion that this field is real in spite of opinion of the Patent Office. The early lack of reproducibility combined with the unfortunate early claims of Pons and Fleischman have combined to discredit this entire area of investigation.

As the Prof. Hagelstein Declaration states,

"The scientific results presented by Dr. Mitchell Swartz on his Phusor experiments, in which excess power and total energy is measured, looks very good. His results are competitive in terms of reproducibility and power gain with the best results obtained by other groups around the world. The reproducible energy gains that he has reported are the highest so far reported by any group."

The Dr. Ahern Declaration states,

"I have known Mitchell Swartz since 1991. I would like to express my strong support for the work being conducted by Dr. Mitchell Swartz in the field of isotopic fuel loading of metal lattices and lattice assisted nuclear reactions. I believe his investigations are some of the most thorough and precise yet conducted in isotopic loading and lattice assisted nuclear reactions, and that the thermal effects he is observing are real and will ultimately be useful on a large scale."

87. Where is the Examiner's technical response? In fact, such widespread replications of cold fusion, and other developments in the field, have more evidentiary value than the few flawed "negative" reports cited by the Examiner. The facts dispute the erroneous rejection of all pending claims made by the Examiner pursuant to 35 U.S.C. 112, first paragraph, based upon the Examiner's incorrect -- and unfounded given the supplied Declarations -- opinion that the "environment" in which the above-entitled invention operates "does not exist". In contrast to the few "nay-sayers" the Office cites, and in contrast to the stale, biased (none refer to lattices and nuclear energy, even though Mossbauer effect proves they should have) books, papers, and newspapers to which the Office refers in its new argument, stand the facts and the Declarations which demonstrate the existence of these reactions, and even their generation of nuclear fusion products (such as helium-4), and the operability of the present invention. The positive results, the Declarations, and the peer-reviewed published literature have much more evidentiary value than the few "negative" less credible -- recycled and older -- reports cited by the Examiner. Therefore, the subject matter sought to be patented as defined by all pending claims have operability, and resides in a field which does exist and have utility.

LANR/CF EXISTS DESPITES THE USPTO'S EFFORTS

88. The Examiners' notion presented by the Office has been that lattice related nuclear reactions do not exist, and that there is no nuclear chemistry in deuterated palladium alloys. However, that is not true (confer Exhibit "E"). The Applicant disagrees. Declarants disagree. DTRA disagrees. DARPA disagrees. The US Navy disagrees. Thousands of scientists disagree. The literature supports the "existence" of the "cold fusion" effect(s). Lattice Assisted Nuclear Reactions (LANR), also known as Condensed Matter Nuclear State Physics (CMNS), and Solid State Nuclear Reactions, and Lattice Enabled Nuclear Reactions and Low Energy Nuclear Reactions (LENR) are real. Despite the determined flawed opinion of the Examiner, cold fusion in lattices is real.

89. There IS evidence that "lattice assisted nuclear reactions" [LANR] are real, and offer a clean, efficient potential new source of energy production (***). In 1989, most efforts failed because of flawed paradigms, cracked inactive palladium cathodes, contamination (including from ordinary water), and most often, improper cell configurations, inadequate or questionable loadings, and incubation times. The patterns of failure have been many and have been discussed in detail elsewhere [1,38]. Although, in 1989 the physics community did not believe the initial P-F experiments since fusion

was not known to occur at low temperatures or in solids. Today, the experimental facts rule. The initial failures, some which took years to understand, involved bad paradigms, questionable materials and loadings, but that is now resolved. Particle emission, excess energy, power gain, commensurate linked helium-4 production, increasing power gains and total energies achieved since 1989, all pave the way to an important, new, clean form of energy production: LANR.

(***) In the following brief review, the numbers in brackets [] refer to the references below. They all demonstrate the Office notion is wrong. The subject of cold fusion (LANR, LENR, CMNS, by whatever acronym for lattice assisted nuclear fusion) has drawn a reaction historically similar to treating baldness which was once considered by the Office to also to be an inherently unbelievable undertaking. See *In re Ferens*, 417 F.2d 1072, 1074, 163 USPQ 609, 611 (CCPA 1969); *In re Oberwener*, 115 F.2d 826, 829, 47 USPQ 455, 458 (CCPA 1940). However, since then, treatments for baldness have gained acceptance with minoxidil and other materials now recognized as effective in treating baldness.

90. Two decades of R&D, sub rosa, have investigated LANR phenomena ranging from excess heat production (far above the input), very low level but measurable emissions, thin films, and coupling to motors and electricity production systems. A few hundred credentialed scientists with diverse backgrounds continued to conduct careful experiments as they performed detailed data analyses using improved instrumentation, equipment, calibration, and controls. No single error or combination of errors on the part of all of the scientists can explain the developing results. They have been reported in over 3000 papers [55]. These two decades of LANR R&D have confirmed excess heat production, and other clearly nuclear phenomena, using electrolysis and other gas loading techniques. Requirements for success include incubation time, high loading of >90% PdDx, and other requisite conditions difficult to achieve. Several types of LANR now exist, as well as LANR metamaterials, and several types of triggering and control methods. In LANR, excess heat and helium-4 are the usual products, but charged particles, tritium, and the sequelae of neutrons can be sometimes detected. Excess power gains up to 200-400%+ have been reported. Given the prevalence of the fuel, and the incredible efficiency, LANR could be an important revolutionary technology. Lattice assisted nuclear reactions [LANR; refs. 1-44] enable deuterium fusion. It is incredibly clean and free of pollution, all toxic emissions, all carbon footprints, all greenhouse gases, and radioactivity, while obviating fossil fuel. The deuterium is plentiful in the oceans. But the problem with this new technology is that the first published LANR reaction involved the 1989 Pons-Fleischman (Drs. Martin Fleischmann (Southampton, UK) and Stanley Pons (Utah); P-F) experiment which was called "cold fusion" [1,2].

Before that, the term was originally introduced by Benjamin Franklin for fulgurites, created by atmospheric lightning discharging into sand. Rather than agglomerating sand, LANR's core is quite different, involving a metal, like palladium, loaded fully with heavy hydrogen [45-51], obtained either from deuterons from heavy water or gaseous deuterium.

91. The Office's indelibly proven-incorrect opinion that one of the "environments" in which the above-entitled invention operates "does not exist" is made on a leap of faith based upon flawed reference to other old art ("FP" or "F+P") while systematically ignoring Appellant's (then Applicant's) submitted Declarations of fact and accompanying Exhibits proving the Office wrong and disingenuous. The Office must eventually admit that, as in baldness control, the field discussed by the Office where the present invention can be used, does exist. Furthermore, corroborating that fact, the PTO has granted patents in this field, just as they are granted around the world. The continued discrimination against the Applicant is egregious because it is commonsense that the individuals in the scientific community who actually attend the Conferences in cold fusion are the same ones who evaluate its products and publications. This community as defined by the rules of the Office and by commonsense -- if it will be applied in this case -- verify the existence of the field. Publications show that growing numbers of the scientific community consider the positive results of cold fusion as being confirmed. Where is the Examiner's comment on any one which proves the statements of the Examiner are disingenuous. Said publications continue to this day, including (and each of which show the Office's opinion is flawed):

LANR IS CONVENTIONAL PHYSICS AND ENGINEERING

92. LANR is consistent with conventional physics. Cold fusion was only superficially investigated in March 1989. P-F announced that the "electrochemical experiments" they had conducted had produced more energy ("excess energy") than could be accounted for, either by input energy or by available chemical reactions. They speculated that nuclear reactions were involved. Attention was directed to CF which savaged its messengers for global sensation and to benefit special interests. Was there a substantive basis for this attack? Fusion had not been explored, and was not known to occur, at low temperatures or in solids in a lattice. High energy theoretical physics never involved a lattice in the nuclear calculations. And yet, in favor of LANR, this was not the first time a lattice was involved with coupling to nuclear effects. Mossbauer effects [52-54] preceded cold fusion, as were other physics and engineering calculations which would eventually prove cold fusion is consistent with physics. Although the Mossbauer effect involves nuclear decay, it also shows a coherent

momentum coupling to the lattice as a whole. The relevance to LANR is not the nuclear decay versus nuclear fusion, but the fact that the Mossbauer effect actually heralds one real existing case of nuclear lattice coupling. It is an example of a coherent linkage between the nuclei and electronic s-orbitals bathing them, coupling them to the entire solid state lattice. It demonstrates that the lattice is important in this branch of nuclear physics and must be considered, even if it was not previously.

The LANR-derived 'excess energy' begin at high energy, in the excited state of Helium, which is obtained from reactions between deuterons within the lattice. That helium-4 excited state is either the first excited state, or one energetically located above it, all at least 20 million electron volts (20 to ~23+ MeV) above the ground level. This is significant in magnitude and clearly not "low energy", as often (mis)claimed. As such purported "low energy nuclear reactions (LENR)" are a misnomer, a paradoxical description of what is actually not observed. Furthermore, if these reactions are "low energy reactions", then why even bother? Fortunately, they are high energy reactions.

93. Today, LANR research involves electrolytic (with solution resistance ranging from conventional to 'high impedance' devices in the range of 200,000 ohms), gas loading, gas permeation, ion beam and glow discharge loading techniques and devices. They run in both open and closed systems, at pressures up to 10,000 psi, and driving motors, with on-line monitoring, redundant, high precision, time-resolved semiquantitative calorimetry. What has been learned? That LANR is real and generated in one of three different sites within the solid state, deuteron-loaded, metallic palladium lattice [42]. Each location has its own, differing, rate of excess heat, tritium, and helium production and appears to be linked to a different group of optimal operating point [OOP] manifolds characterizing active LANR samples and devices [39-44].

94. The fuel for LANR is the deuteron. It is driven into the metal by the applied electric field intensity or by gas pressure applied. In most cases, the product is an extraordinary amount of heat. Commensurate with the amount of excess heat is the "ash", usually de novo helium-4. The important point is that from those high energy levels of He4* made in LANR come the observed excess energies in those difficult-to-achieve loaded lattice conditions, under some conditions. These reactions are complex, and under some conditions, tritium and other emissions result. Some of the variety of regions involved both within, and upon, the metallic lattice is shown in Figure 1 [42]. Like hot fusion, the keys are containment, time, and density, but with flux substituted for temperature [43,44,37,1,56, for example]. This first key for LANR is that the PdDx alloy must be driven, usually electrically, to extremely high loading, until it is filled and almost bursting like a sponge with water. The electrode must accept and maintain

high loading for excess heat (>90%), for a sufficient incubation time, up to several hundred hours. Why? Vacancies must drift into the bulk from the surface, slightly facilitated by the loading itself [7, 56, 57, 58].

95. The additional keys for LANR are that there must be integrity of the loaded alloy; a condition difficult to achieve, although it is circumvented to some degree by the codeposition methods, albeit with their limitations [7,5]. As the lattice loads, it swells. Too much swelling yields irreversible failure, just like a swollen, burst, balloon. Another requirement is that deuteron flux must continue, within and through the already highly loaded lattice. LANR success is rewarded by "excess heat", which means that the energy producing reactions, have generated de novo helium into the lattice, (~1012 for every watt-second), and those conditions were adequate to enable energy transfer to the lattice. LANR success also means that significant energy (think, $E=mc^2$ from the tiny difference between D2 and He4) is released rather than the low energy released by "burning" the deuterons into heavy water. There is more heat released than if the entire cathode were substituted for an equivalent quantity of TNT, but in this case it is safe, clean, and efficient.

SEVERAL TYPES OF LANR

96. The LANR method which P-F first taught in March 1989 had problems, including inefficient reproducibility, and a requirement for very high loading with long incubation time. This created havoc for those inexperienced in metallurgy, electrochemistry and physics. Today, briefly, there are several types of LANR; conventional (F+P), two types of codeposition (JET Energy, SPAWAR), dual cathode (Arata) systems, and a variety of other loading systems. On one hand, development for high power has led to today's high electrical solution resistivity LANR systems (very low levels of electrolysis yield superior excess heat levels pioneered by JET Energy) and then LANR metamaterials (JET Energy; 59). Metamaterials use shapes engineered to control deuteron flux, even at equilibrium, and even after loading, such as shown in Figure 2. The Phusor® spiral cathode system, with its open helical cylindrical geometry, in a high electrical resistance solution, creates a unique and unusual electric field distribution [59]. There is an anomalous effect in those portions of the cathode closest to the anode. This results in both deuteron loading flux from the solution to the electrode, and intra-palladium deuteron flux [59].

This configuration is a new kind of Pd/D2O/Pt and Pd/D2O/Au engineered LANR structure with impressive energy gain and fairly good reproducibility [4, 7, 10, 60]. These contain low paramagnetic content heavy water creating a unique, distinguishing electric field distribution quite different from customary wire-wire and plate-plate

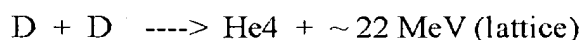
systems. LANR metamaterials, and high loading systems (included those explored by IENA, Energetics) and metallurgically engineered electrodes (NRL, SPAWAR, JET Energy) all point the way to high output powers and efficiencies.

97. On the other hand, codeposition LANR systems (see '976) point the way to speedy onset for some of the reactions. Codeposition yields faster results without the prolonged incubation times. In codeposition systems, fresh Pd and D plate out together on the cathode. Highly expanded surfaces, nanoscale spherical nodules dominate on the growing surface. Cyclic voltammetry and galvanostatic pulsing experiments indicate, and excess heat measurements herald, that a high degree of deuterium loading (with an atomic ratio $D/Pd > 1$) is obtained within seconds. The results to date indicate nuclear reactions which occur very near the surface of the electrode (within a few atomic layers). In the original JET Energy Pd/D codeposition process, working and counter electrodes are immersed in a solution of palladium solution with neither chloride nor lithium, deposited on palladium. In the SPAWAR Pd/D codeposition process, working and counter electrodes are immersed in a solution of palladium chloride and lithium chloride in deuterated water, deposited onto silver, gold, or copper. There are physical differences in the two types involving deep diffusion [5], where Pd is deposited either on palladium (like Dr. Swartz) or upon non-loading materials such as copper, gold, silver, or platinum (like SPAWAR).

98. SPAWAR and JET have investigated the physical changes, the excess heat generation, hot spots with calibration showing near and far IR emission (Figure 3). JET Energy's and SPAWARS (near- and medical IR imaging) have revealed that in LANR there are cathodic hot spots, and not just Joule heating in the solution (IR drop). The desired reactions producing excess energy yield localized hot spots (Szpak). The calibrated imaging of these localized hot spots, using an infrared camera, reveal non-thermal near-IR emissions correlated with excess heat (Swartz) in active LANR devices by in situ monitoring [ref. 11; Figure 3]. This discovered non-thermal IR (NT-NIR) is linked, and specific, to the presence of excess heat production and not their physical temperature. This confirms the Swartz-Verner hypothesis that in LANR, unlike hot fusion, Bremsstrahlung emission, under increasingly lower temperatures, shifts from penetrating ionizing radiation toward skin-depth-locked infra-red radiation [61].

LANR REACTIONS

99. In LANR, excess heat and helium-4 are the usual products, but charged particles, tritium, and the sequelae of neutrons can be sometimes detected. Excess heat and helium production are the dominant reactions. Melvin Miles of China Lake with Johnson-Matthey Pd rods was the first to show the correlation of heat and helium-4 production. Arata and Zhang reported de novo He-4 with LANR, including with ZrO₂/Pd powder exposed to deuterium gas, but not with hydrogen gas. Les Case (28; NH), using LANR with platinum group metals on carbon catalysts, reported He-4 production from deuterium gas. As a result of these findings, but ignoring the impact of the lattice for the moment, the reaction is something like



100. Energy and momentum are conserved in LANR [63,62,49], and because of the unique relationship to the lattice, the helium generated is moving slowly, at low velocity, very unlike hot fusion (discussed below). The He-4 which appears is retained in the cathode, until very high temperatures (~850C). The peak energy is consistent with the relatively low energy, but penetrating, ionizing radiation. Miles (China Lake, USN) and M. Srinivasan (Bhabha Atomic Research Center, BARC) independently used dental x-ray films on the outside of his apparatus; they became fogged indicating low energy x-ray production. In rare conditions, tritium production has been seen. In India, M. Srinivasan from the (BARC) reported tritium in 1989. John Bockris (Texas A&M) reported tritium in bursts but the tritium was not accompanied by measurable heat, which he measured in other experiments. Szpak (SPAWAR) in open cells reported 3000 to 7000 atoms per second for a 24 hour period. Ed Storms (LANL) reported excess tritium in ten percent of his cells.

101. Some experiments have detected very low number neutrons and charged particles with short range. M. Srinivasan (BARC) reported neutrons in 1989. As the current increased beyond 100 amperes, neutron signals, in bursts, resulted in six of 11 cells. X.Z. Li (Tsinghua U) first used CR-39 in his 1990 Pd gas loading experiments to detect energetic charged particles [64]. CR-39 is a polyallyldiglycol carbonate polymer, widely used as a time-integrating, solid state, nuclear track detector. Larry Forsley (JWK International) and Mosier-Boss (SPAWAR) have reported D-D and D-T possible reaction pathways capable of generating the observed charged particles, neutrons, etc. Their CR-39 tracks indicate possible neutron interactions, including carbon shattering. Some tracks herald D-D and DT reactions. Etching suggests uniformity in the 2-8 MeV range. The triple tracks, found in ~5-10 of their experiments, indicate energetic neutrons having shattered a carbon atom. Also observed in LANR systems are post

LANR mini-explosions, ionizing radiation, and neutron production, and tritium production. These observations of significant quantities of high energy charged particles, and emissions, in LANR systems, suggests that there is accumulating, near overwhelming, evidence that nuclear reactions in, and assisted by a lattice, are initiated at low energies.

EXCESS ENERGY OBSERVED IN LANR

102. P-F reported excess energies of 4 MJ (megajoules) in 80 hours. Similar amounts are seen in Figures 4 and 5. Several LANR devices show excess power gains from 25% to several times input electrical power, beyond the controls. High impedance LANR devices have shown power gains 200% to 400%, and one has yielded 8,000% power gain for a short time. JET Energy has shown that some electrodes, of specific shape, are metamaterials which produces excess heat of a superlative magnitude, successfully driving Stirling engines at the 1-19+ watt level [3,4,6,7,39,40,41]. In 2003, JET demonstrated a working LANR high impedance PHUSOR-type LANR systems for five days at MIT at ICCF10, producing ~230% excess energy at 1 to 2 watt level.

103. The most important point is that even if one were to replace the entire cathode with TNT, one would only get 1.2 KJ (kilojoules) on explosion. The excess energy observed with LANR is greater than any known chemical reaction. The second most important point is that the excess energy brings heat and changes wrought upon the electrode. SPAWAR, JWK, Stringham, Dash and others have reported volcano looking pits in electrodes. These induced pits are important for two reasons. First, these features require a lot of local heat to produce the focal melting of the Pd, require substantial energy expenditure in order to form, again consistent with a nuclear source, not chemical. Second, SPAWAR [12, 20, 22, 23], Mitsubishi Industries (Japan) [37], George Miley [U of Illinois, 65], and others have shown elements appearing only at these unusual sites, which are consistent with nuclear, possibly even fission, products, some of which could not be extracted from cell components.

Theories Involving Portions of LANR

104. Theories Involving Portions of LANR - It cannot be true that only one single "theory" will fit all the solid state, nuclear physics and requisite electrical engineering. They involve a complex non-linear, time-variant, system including an overloaded metal lattice, stirring with flux, and electrical currents involving both electrons and deuterons and their holes. In time, also formed are low dielectric constant layers appearing spontaneously in electrical series (bubbles). There are second order applied fields. This is in addition to the electric fields, magnetic fields, and electromagnetic fields including optical, terahertz and other irradiations, which LANR experimentalists use, which result from the drifting electrons, deuterons, and their holes. The bottom line is that no one theory can ever cover it all. Instead, there are several, and they fit conventional physics quite well [31,44,56,58,62, 63,69,70,71,72,73,74].

The quasi-one-dimensional (Q1D; 39-44) model of loading, based on continuum electromechanics, has led to the discoveries of optimal operating points and the key roles of D-flux, solution conductivity, and cathodic irradiation by laser in LANR systems. Recently, coupling this with Laplace's law has uncovered the need for deuteron flux within the palladium in an already highly loaded (D/Pd) LANR system. The Q1D models most important insight is that the first order D-flux equation, with the substitution of the Einstein relation, shows that the ability to load D depends on the ratio of ordering energy, (the applied electric field) to thermal disorder ($k_B \cdot T$) minus what goes up into the gas. The latter is perhaps most important because it reveals why so many have failed to generate successful LANR, because the name "fusion by electrolysis" is a misnomer.

MECHANISM OF LANR

105. How is fusion achieved? Are there 'expected products'? In hot fusion without a lattice, the kinetic energy of 23.8 MeV charged particles (alphas) yields ionizations, Pd knock-off atoms, low energy X-rays, and heat. Secondary neutrons [by $D(\alpha, n)$] have a small cross-section. Most physicists are more aware of the ionization and X-ray production of $D + D$ impact physics without a lattice. In this hotter fusion, the products are fast moving helium [23.8 MeV alpha-particles] which yield 22 keV Pd K shell X-rays and bremsstrahlung below ~4 keV. Conventional bremsstrahlung is ionizing penetrating radiation well-associated with hot fusion. In $D + D$ impact physics without a lattice, neutrons and charged particles (fast moving helium ions, alpha particles) are seen.

In summary, in hot fusion, the production ratios are about 50% neutrons with He3, 50% tritium and a proton, and a tiny fraction (less than 1/1,000,000) as nuclear gamma rays. By incredible contrast, the production ratios observed for LANR reactions is mainly He4, and negligible He3, neutrons and gammas of very low energies.

106. Historically, since 1989, cold fusion was ignored, along with the scientific facts, generally speaking. The basic truth is that the temperature of cold fusion, lattice and the nuclear isospin control which products are observed. The physics in LANR appears conventional, but band energies, lattice and isospin issues, and temperature dependences must be addressed. First, not all emission branches from the excited state of He4* are even spin-available. The gamma emission branch from the excited state of He4* is actually spin-forbidden for both hot and cold fusion [62,63]. However, at higher hot fusion temperatures the restriction is lifted slightly. This is consistent to what is seen for both hot and cold fusion.

Second, the relative absence of neutron and hard gamma-ray penetrating radiation in cold fusion appears to be due to the lack of availability for two different, but thermally linked, reasons. The first thermally linked reason is that the only nuclear branches available are those whose band gaps are surmountable by the available activation energy (limited by the ambient temperature and incident radiation). The neutron emission branch is more than 1 MeV above the first excited state (He4*). Hot fusion has large activation energies available (it is 'hot'). LANR/CF is not. In LANR, given the actual much smaller amount of thermal energy, $k_B \cdot T$, available for cold fusion ($\sim 1/25$ eV), absence of adequate activation energy decisively means that that branch is NOT available, as it is for hot fusion. Neutrons are not observed, helium 4 production is in its stead.

The second thermally linked reason is that in the analysis for LANR, with the explicit incorporation of temperature into the Bremsstrahlung equations, reveals that ionizing penetrating radiation by Bremsstrahlung is not expected at low temperature. The Bremsstrahlung shift (secondary to temperature and lattice availability) alters from what is expected at room temperature with the forward deposition of energy dropping by 18 orders of magnitude. Instead, at cold fusion temperatures, the penetrating ionizing radiation shifts to lower frequencies [to the near infrared (N-IR)] where the radiation is not longer ionizing, and where it is trapped in the palladium by the 'skin-depth' effect. In fact, this shift to near-IR was later observed (and reported) in LANR devices when they were operated at their OOP. The result is non-thermal near-IR emission [11].

107. It is the lattice which is key to the final products. It controls the de-excitations to produce He4 in the ground state if there is coupling to though phonons. In hot fusion, the lattice --and therefore the coupling-- are not there. In LANR/CF, the fast moving He4 (as charged particles, alphas) are not seen because the phonons, each about 35-43 millieV, help the He4* state shed ~20+ MeV to return to the He4 ground state [7, 71,57,38,58]. However, in a coherent lattice, if there are enough phonons to enable transfer in the nanoseconds required. Hence the "excess heat". Ergo, it is the lattice that opens up the new pathway. The many-spin, spin boson model [61,58] has led to discoveries of how exchange energy between oscillator quanta enable coherent energy exchange. One sine qua non is there be enough phonons (lattice vibrations) [7,71,75,57,38,58]. If they act coherently, and if there are enough Frenkel defects, then the lattice appears to be "oiled" enough for coherent energy transfer (this is from where the excess heat arises) from the very high energy nuclear state consisting of the nuclear helium excited state to the lattice [58,62,70,7]. The CAM (catastrophic active media [56]) theory models the unusual change in deuteron solubility that Pd demonstrates with temperature.

108. Much peer-reviewed literature, relevant to the present invention is available, and has been submitted to the Office, where it was removed from the file folder (as reported by Examiner Wasil, for example, and then ignored), including in Fusion Technology [e.g. Swartz, 1998, Improved Electrolytic Reactor Performance Using p-Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85, dispute the Office. The chief product of the cold fusion reaction(s) is excess heat, but other released particles have also been reported {including tritium [Srinivasan, Current Science, 143 (1991); Storms, Fusion Technology, 17, 680 (1990)], sparse neutrons [Gozzi, J. Fusion Energy, 9, 241 (1990); Menlove, J. Fusion Energy, 9, 495 (1990)], helium-4 [Bush, J. Electro. Chem., 304, 271 (1991)], and possibly heavy elements [Matsumoto, Fusion Technology, 20, 323 (1991)]}. The following is up to date information. The Examiner is referred to the Applicant's peer-reviewed article in the Journal of Scientific Exploration (Winter 2009, January 2010), "Survey of the Observed Excess Energy and Emissions In Lattice Assisted Nuclear Reactions".

The Literature Supports the Applicant

109. Where is the Examiner's Response to the more than 300 publications which the Applicant has sent the Office taken from peer-reviewed journals? This has been several hundred pounds of Exhibits, including over 40 of the Applicant's own peer-reviewed papers (several published by the American Nuclear Society, *Fusion Technology*)? Instead of a substantive response, in the new arguments made by the Office, there is ignoring of data, Exhibits, and Declarations, which the Applicant has supplied. The Exhibits constitute significant, growing reputable evidence of record which easily overcomes the few "negative" showings in the Office's ancient references, allegedly "disproving" the concept of "cold fusion". In contrast to the few "nay-sayers" the Office cites over and over, and in contrast to the "older" books, papers, and newspapers which cite failed experiments to which the Office refers to in its new argument, stand the Applicant's submitted original specification and supporting published papers, facts, Exhibits, and Declarations which demonstrate both the quality and quantity of corroborations of the existence of these reactions. Applicant's peer-reviewed published literature in series of published reports has more evidentiary value than the few "negative" less-credible recycled, older reports cited by the Examiner which do not even mention Applicant's work.

110. Where is the Examiner's Response to the fact that the U.S. Electric Power Research Institute (EPRI) has obtained positive results (Swartz 97A), as has NASA (Neidra 96A, Neidra 96B), the French atomic energy agency [confirming the cold fusion effect as originally reported by Dr. Fleischmann and Pons (Lonchampt 97)], and many US laboratories including US NAVY? Instead, the Office relies on its rebutted "reports" from "science" reporters and those competing for Federal funds, all of whom do not even refer to the present invention. Nor have they been sworn in, or have been proven to be an expert, as the Applicant has done with his Declarants.

111. Where is the Examiner's Response to Applicant's citation of Dr. Miles reports that near commensurate "ash" (i.e. order-of-magnitude expected amounts or greater) consistent with a nuclear process was found linking the formation of helium-4 to the excess heat using metal flasks which were used to capture the helium-4 linked to the excess heat [Miles (1993); also "US NAVY CONTINUES POSITIVE EFFORTS SUPPORTING COLD FUSION"; COLD FUSION TIMES (pages 1-2) volume 1, number 4 (1994)]?

"Our previous results present a correlation between the measured excess power and helium production in D₂O-LiOD electrolysis cells using palladium cathodes. The measured rate of ⁴He production (10¹¹-10¹² ⁴He/s*W) is the correct magnitude for typical deuteron fusion reactions that yield helium as a

product. ***** Metal flasks were used to collect the electrolysis gas samples in order to minimize atmospheric contamination due to helium diffusion through glass. The helium concentrations in Table II support a detection limit of approximately 10^{13} $^4\text{He}/500\text{ mL}$ in these experiments as reported previously. Mean values for the measured helium concentrations in these control experiments are 4.4 ± 0.6 ppb or $5.1 \pm 0.7 \times 10^{13}$ $^4\text{He}/500\text{ mL}$ For experiments producing excess power, five helium measurements using these same metal flasks have been completed. These experiments yield a mean value of $2.0 \pm 0.5 \times 10^{11}$ $^4\text{He/s} \cdot \text{W}$ after correcting for background levels of helium measured in control studies (Table II). This value is once again the correct magnitude for typical deuteron fusion reactions that yield ^4He as a product."

["HEAT AND HELIUM MEASUREMENTS IN DEUTERATED PALLADIUM"; M. M. Miles and B. F. Bush, Chemistry Division, Naval Air Warfare Center Weapons Division China Lake, CA USA (12/1993)]

112. Where is the Examiner's Response to Applicant's citation of confirmations of Dr. Miles' nuclear (helium-4) findings? Excess heat, tritium generation, and other products, produced by the desired reactions, have been found by scores of groups supporting Applicant's claims at the time these patent applications were filed. The reactions products (particles and excess energy) have been elicited both by the electro-deposition of deuterons onto palladium cathodes and by temperature cycling of deuterided palladium or titanium. Many of the laboratories publishing such results are listed in a table in Dr. Mallove's book on pages 246 through 248. The chief product of the cold fusion reaction(s) is excess heat [Mills 91, 94; Mizuno 96D; Storms 93; Arata 90; Swartz 97B; Mizuno 96D; Celani 96A; Storms 96A; Pons 90; Notoya 93; Fleischmann 89, 90; Mallove (Fire from Ice); Lonchampt 96, 97; Oriani 96; Mizuno 94; Bockris 90; Szpak 91B, 96A; McKubre 91; Will 91; Nobel 95 and Miles 94C, 96B], but other released particles have also been reported {including tritium [Srinivasan, Current Science, 143 (1991); Chene 90; Rout 91; Storms, Fusion Technology, 17, 680 (1990); also Notoya 94A, 94B; Will 93, 94; Claytor 96A, 96B], sparse neutrons [Gozzi, J. Fusion Energy, 9, 241 (1990); Menlove, J. Fusion Energy, 9, 495 (1990); also Gozzi 90A, 90B; Ogawa 96; Perfetti 89; Wada 89; Bittner 91; Celani 97], other particles [Karabut 92; Chambers 91; Taniguchi 89; Iwamura 94], helium-4 [Bush, J. Electro. Chem., 304, 271 (1991); also Miles 94C, Miles 91, 93B, 94C, 96B; Bush 96], some radiation [Szpak 96B; Celani (90)], and possibly heavy elements [Matsumoto, Fusion Technology, 20, 323 (1991), Karabut (92)] Matsumoto 92; also Ohmori 96A, 96B; Savvatimova 94, 95; Mizuno 96A, 96B, 96C; Miles 96C, 97A; Miley 96]}.